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(54) Title: METHODS FOR MEASURING THE RATES OF REPLICATION AND DEATH OF MICROBIAL INFECTIOUS AGENTS IN AN INFECTED

(57) **Abstract:** The present invention provides methods and kits useful for determining rates of replication and destruction of an infectious agent within an infected host organism. In the methods of the invention, an isotopically-labeled precursor molecule is administered to an infected host, and is given sufficient time to pass into the host's metabolic pools into a biochemical component of the infectious agent. The isotopic content and/or pattern or the rate of change of the isotopic content and/or pattern of the biochemical component is then measured to determine the rate of replication (growth) of the infectious organism while in the host. Alternatively, isotopic decay of labeled molecular components of the infectious agent is measured over time after discontinuing administration of the isotopically labeled precursor molecule to determine the rate of destruction (death) of the infectious agent while in the host. Thus, using methods of the invention, *in vivo* sensitivity of infectious agents to drug agents may be determined, in order to optimize therapy of the infected host.

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